



US009636647B2

(12) **United States Patent**  
**Vincent et al.**

(10) **Patent No.:** **US 9,636,647 B2**  
(45) **Date of Patent:** **May 2, 2017**

(54) **REAGENT CARTRIDGE MIXING TUBE METHOD**

(56) **References Cited**

U.S. PATENT DOCUMENTS

(71) Applicant: **Biokit S.A.**, Barcelona (ES)

8,279 A 8/1851 Chase  
33,146 A 8/1861 Harsha  
(Continued)

(72) Inventors: **Kathleen Vincent**, Pelham, NH (US);  
**Mark Talmer**, Pepperell, MA (US);  
**Gerhardt P. Schroeder**, Londonderry, NH (US)

FOREIGN PATENT DOCUMENTS

(73) Assignee: **Biokit, S.A.** (ES)

EP 0712000 9/1995  
EP 0806665 5/1997

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 619 days.

(Continued)

OTHER PUBLICATIONS

(21) Appl. No.: **14/041,196**

English translation of an Office action issued in a counterpart Japanese Patent Application No. 2013-008301 on Apr. 23, 2014 (4 pages).

(22) Filed: **Sep. 30, 2013**

(Continued)

(65) **Prior Publication Data**

US 2014/0086005 A1 Mar. 27, 2014

*Primary Examiner* — Charles Cooley

(74) *Attorney, Agent, or Firm* — Burns & Levinson, LLP

**Related U.S. Application Data**

(60) Division of application No. 12/756,293, filed on Apr. 8, 2010, now Pat. No. 8,550,697, which is a  
(Continued)

(57)

**ABSTRACT**

A clinical instrument analyzer system for automated analysis of patient samples with a system for suspending particles or methods for the separation of particles, such as magnetic particles, is described herein. The system for suspending particles comprises a reagent cartridge comprising a reagent holder for holding a plurality of tubes. The plurality of tubes comprise a mixing tube for holding particles, rotatably mounted in the holder and a motor operatively connectable to a slot longitudinally positioned on the lower section of the mixing tube. The particles in the mixing tube are suspended when the mixing tube rotates in accordance with the embodiments of the invention. The analyzer can be used to analyze bodily fluid samples, such as blood, plasma, serum, urine or cerebrospinal fluid.

(51) **Int. Cl.**

**B01F 9/10** (2006.01)

**B01F 11/00** (2006.01)

(Continued)

(52) **U.S. Cl.**

CPC ..... **B01F 11/0002** (2013.01); **B01F 9/002**  
(2013.01); **B01F 11/0005** (2013.01);

(Continued)

(58) **Field of Classification Search**

CPC ..... B01F 9/0014; B01F 9/0018; B01F 9/002;  
B01F 11/0002; B01F 11/0005;

(Continued)

**12 Claims, 15 Drawing Sheets**

